

I. IDENTIFICATION DATA

Thesis title:	Design of multistorey steel car park
Author's name:	Ramazan Koca
Type of thesis :	master
Faculty/Institute:	Faculty of Civil Engineering (FCE)
Department:	Department of Steel and Timber Structures
Thesis reviewer:	Ing. Radek Pošta, Ph.D.
Reviewer's department:	Allcons Industry s.r.o.

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment <i>How demanding was the assigned project?</i>	ordinarily challenging
The chosen project is suitable for a master thesis.	

Fulfilment of assignment <i>How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.</i>	fulfilled with major objections
Author made correctly several checks of partial elements. These checks are unfortunately based on wrong inputs. Internal forces, static schemes, non-working details, etc.	

Methodology <i>Comment on the correctness of the approach and/or the solution methods.</i>	partially applicable
Preliminary and final design seems to be a good idea. What is weird is that preliminary design starts in chapter 2.2 and final design in chapter 2.2.3 instead 2.3.	

Technical level <i>Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?</i>	F - failed.
Autor knows how to check cross section based on entered internal forces. This is the basis of a bachelor's study. Correctness overall behavior of structure ensured by suitable details and right static schemes is missing.	

Formal and language level, scope of thesis <i>Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?</i>	F - failed.
Tables and details are unreadable (for example pages 9, 12, 92). Drawings are not technical drawings at all. Author doesn't know, where continuous, dashed, dash-and-dot lines has to be used, marking of bolts, marking of sections, views etc. Some of paragraphs are hard to understand. For example page 12.	

Selection of sources, citation correctness <i>Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?</i>	E - sufficient.
No comment.	

Additional commentary and evaluation (optional) <i>Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.</i>	
See below.	

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

- 1) Autor claims that steel structure is robust and fire resistant. This is not correct. Probably because of it the fire check is not included. (page 6)
- 2) Total load deflection limit is $L/150$? It seems to be benevolent. Specify the source.
- 3) What is on picture 2.2.2? Is it static scheme? How author marks the supports? Why the reactions are shown at odd axis only? Description below the picture has no sense.
- 4) Where is check of concrete slab on span 17m?
- 5) A_{vz} is not 9321mm^2 and 4113mm^2 at HEA600 respective HEA320.
- 6) Opponent doesn't understand to description in chapter 2.2.3. Where is secondary beam? Where is span 18m? Some beams HEA320 are in axes 1 and 18, but there is no span 18 transverse on them, moreover the slabs are supported in axes B, E, H.
- 7) Minimal wind load in Prague with terrain category 4 is $0,372\text{kN/m}^2$. Where is calculation of mentioned $0,32\text{kN/m}^2$?
- 8) The force from wind in column is calculated on page 24. Where are the wind pressure coefficients, why the value is not divided by bracings number at one row? The resulting value is reaction and no additional force in the column.
- 9) The critical length of the column is determined as 3,5m. How it is ensured? By the eccentrically supported concrete slabs on thin plates with Teflon desks and slotted holes?
- 10) Where are mentioned the horizontal forces from braking and starting the cars? Forces from wind friction? Temperature loads? Loads from barriers?
- 11) In axis E is one HEA placed in centre axis of columns. Drawing 3. The calculation of single beam and connection is not mentioned.
- 12) The "continuous" beam is divided at the connection on picture 2.2.5. After that it is no continuous beam. If the student considers continuous beam, assembly connection has to be included in the project. His position and calculation.
- 13) Force $V_{Ed} = 107\text{kN}$ used in several calculation is wrong! Too small. Compare with total force in column or shear forces on picture 2.2.4. More over sometimes is used only as force from one side of continuous beam (check of connection – 4 bolts) and sometimes as force from both sides of continuous beam (local bending of the column). Finally, mentioned local column bending by eccentricity can't be transferred to surrounding structure. The total bending moment at the lower part of column has to be multiple by number of floors.
- 14) In section 2.2.3.4, there is a summary of the results that proves nothing. The deformation has to be compared with something. Is it the relative deformation of the beam or the total deflection of the structure?
- 15) The bending moment $307,19\text{kNm}$ at base of the column is shown on picture 2.2.3.4.5. It means, that author used fix supports at structure with vertical bracing system, why?
- 16) The fix anchoring is not calculated in the project. The anchoring bolts are not check on tension! The shear keys are missing in supports in places of bracing. Grouting is not mentioned.
- 17) M_x is not bending moment in Czech Republic. Figure 2.2.3.4.

- 18) In project is not static scheme of the roof. The calculation of this part of structure is missing same as check of cladding and purlins.
- 19) The bracings used in the project (SHS 110/110/14,2) are not suitable when compression is decisive (weight against small i_y , i_z). Why are not graduated through the structure height? The angel of bracing is much less than 30° and it is no effective. There is also no check of bracing connection.
- 20) In the drawings are a lot of mistakes. For example, detail on drawing 5 is structurally bad and doesn't correspond with authors assumption of line load on continuous beam HEA600. (The slabs are connected strictly to the column.) Locally extension of base plate due to used bracing on drawing 1 is nonsense. Why the section A-A on drawing 4 is cut in the middle of height? Welds are missing in the details in drawing 1, 6, 7. Etc.

The level of this project unfortunately doesn't correspond with master thesis.

The grade that I award for the thesis is **F - failed**.

Date: **24.1.2022**

Signature:

